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Identification and management of physical health problems among an injecting drug using population

Robert Patton

Injecting drug use is highly prevalent in London and is associated with specific physical health problems. These problems are related to the toxicity of the substances, their mode of consumption and as a consequence of the drug taking lifestyle. Hepatitis B and C viral infections are common among drug users due to sharing of both needles and other drug taking paraphernalia. Hepatitis B infection can be prevented by immunisation. Hepatitis C infection can interact with alcohol consumption to accelerate liver damage. Sharing of drug injection equipment is high (up to 78%). Injecting drug users (IDUs) that live close to needle exchanges are significantly less likely to engage in sharing activities than those that live further away. Drug users are at particular risk of developing poor dental health, which is associated with morbidity and mortality, particularly cardio-vascular conditions and respiratory disease. Many female drug users have been involved with the commercial sex industry and are at risk of contracting blood borne viruses. Drug users who also use alcohol have an increased likelihood of physical morbidity and injury / trauma. Problem drug users have an increased likelihood of experiencing physical morbidity, but are less likely to engage with primary care services. Barriers to accessing primary care include convenience (access), apathy, procrastination and “self-medication”. Drug users are more likely to report physical health complications at an Accident & Emergency department (AED) than at a GP practice. Further investigation of local AEDs is required to ascertain their potential for assessing and referring drug users to specialist services and other primary care providers. Integration of primary care and drug treatment services may encourage drug users to engage in treatment for physical morbidity and promote retention within addictions services. Physical health of drug users may be assessed as part of a formal induction to treatment services, or opportunistically as appropriate. Drug users presenting to primary care services for prescriptions related to their addiction may not experience such an assessment. Increasing GPs knowledge and skills can lead to greater implementation of screening practices. The provision of primary care services to clients attending addiction treatment centres can lead to improvements in drug users’ physical health and enhanced treatment outcomes.

Identification and management of physical health problems among an injecting drug using population

Robert Patton
National Addiction Centre, King's College London

**Conducted as part of the Primary Care Needs Assessment Project on
behalf of Lambeth, Southwark and Lewisham PCTs.**

**The views expressed in this article are those of the author and are not intended to represent
the views of the PCTs or the Department of Health**

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EXECUTIVE SUMMARY

1. Injecting drug use is highly prevalent in London and is associated with specific physical health problems. These problems are related to the toxicity of the substances, their mode of consumption and as a consequence of the drug taking lifestyle.
2. Hepatitis B and C viral infections are common among drug users due to sharing of both needles and other drug taking paraphernalia. Hepatitis B infection can be prevented by immunisation. Hepatitis C infection can interact with alcohol consumption to accelerate liver damage.
3. Sharing of drug injection equipment is high (up to 78%). Injecting drug users (IDUs) that live close to needle exchanges are significantly less likely to engage in sharing activities than those that live further away.
4. Drug users are at particular risk of developing poor dental health, which is associated with morbidity and mortality, particularly cardio-vascular conditions and respiratory disease.
5. Many female drug users have been involved with the commercial sex industry and are at risk of contracting blood borne viruses.
6. Drug users who also use alcohol have an increased likelihood of physical morbidity and injury / trauma.
7. Problem drug users have an increased likelihood of experiencing physical morbidity, but are less likely to engage with primary care services. Barriers to accessing primary care include convenience (access), apathy, procrastination and “self-medication”.
8. Drug users are more likely to report physical health complications at an Accident & Emergency department (AED) than at a GP practice. Further investigation of local AEDs is required to ascertain their potential for assessing and referring drug users to specialist services and other primary care providers.
9. Integration of primary care and drug treatment services may encourage drug users to engage in treatment for physical morbidity and promote retention within addictions services.
10. Physical health of drug users may be assessed as part of a formal induction to treatment services, or opportunistically as appropriate. Drug users presenting to primary care services for prescriptions related to their addiction may not experience such an assessment. Increasing GPs knowledge and skills can lead to greater implementation of screening practices.

11. The provision of primary care services to clients attending addiction treatment centres can lead to improvements in drug users' physical health and enhanced treatment outcomes.
12. The DAHCT should carry out an audit of their client group using one of the recommended measures to determine the range and scope of physical morbidity and a formal evaluation of the teams' impact on both primary care needs and treatment outcomes undertaken.

1.0 INTRODUCTION

Illicit drug usage is highly prevalent in London, and indeed throughout the UK. Data from the British Crime Survey (2000)¹ indicates that 1% of the population aged 29 and under have taken heroin and / or crack cocaine, and for powder cocaine the figure is as high as 12%. However, the use of such household surveys to estimate levels of misuse has been criticised, as problem drug users are less likely to respond to such surveys than non-users. Instead, the use of capture recapture methods has been advocated as a more accurate way of estimating prevalence. Using this methodology, Hickman et al (1999)² estimated that up to 1.5% of the population of Lambeth, Southwark & Lewisham (LSL) aged between 15-49 years used opiates, with up to 3.9% of the population classified as problem drug users (approximately 12500 residents).

In a recent report, *London: The highs and lows* (2003)³, the authors report data taken from the National Drug Treatment Monitoring System, citing that between April 2001 and May 2002 over 3300 residents of LSL sought treatment for drug dependency (within Greater London – those seeking help from agencies located outside the capital were not included in this data). Although treatment for substance misuse may be effective at either promoting abstinence or harm reduction (depending on the model applied), those persons who misuse drugs may well experience a degree of psychological and physical morbidity that is not directly related to their consumption. Indeed over a decade ago Selwyn et al (1993)⁴ noted that primary care services for injecting drug users (IDUs) should be able to address a range of acute and chronic diseases, not specifically related to drug misuse.

Drug users may experience physical problems that are associated with the toxicity of certain substances, directly related to their mode of consumption (such as those specific to injection), and finally they may experience health problems that result as a consequence of their lifestyle. In this review we shall deal specifically with physical health problems associated with either the use of injectable substances (mainly opiates), or crack cocaine.

1.1 LITERATURE SEARCH STRATEGY

Medline®, Psychlit® and Web of Science® databases were employed using Boolean combinations of the terms *physical, health, primary, inject*, crack, drug, assessment, general, medical, care, satisfaction, barrier*, prevention, promotion, immunisation, hepatitis, misuse, need, substance, intervention*. Abstracts of relevant papers were examined and full text reprints obtained as appropriate using the KCL and NHSCA24 gateways.

2.0 GENERAL HEALTH PROBLEMS

In a review of the literature Weisner et al (2001)⁵ identified specific conditions related to substance misuse: depression, injury, poison / overdose (OD), anxiety, hypertension, asthma, psychosis, non-specific gastro-intestinal problems (NSGI), heart disease, gastritis, and neuropathy.

General nutritional problems have been reported among IDU populations. Sad (2003)⁶ observed that almost all of the clients at a combined needle exchange / vaccination

clinic looked to be underweight, but notes that an assessment of body mass index was not undertaken.

Williams et al (1996)⁷ discussed the health problems often encountered by IDUs admitted to a general hospital setting; overdose (OD), trauma, tuberculosis (TB), abnormalities of liver function (due to hepatitis and / or alcohol misuse), and skin problems (abscess, cellulitis). The pattern of drug(s) taking can also have an impact on physical morbidity and mortality; Gossop et al (2002)⁸ found 68% of deaths of those in treatment were due to OD – specifically a polydrug cocktail and /or combination of illicit drugs with alcohol. The authors note inconsistencies in recording on death certificates, suggesting that drug related deaths might be under-reported. Rates of TB of 3% among IDUs (much higher than in a population of non-users) have been reported by Kemp (2003)⁹.

The chaotic lifestyle of drug users can also have an impact on physical health, in particular with regard to accidents and incidents of violent crime. Gossop et al (2002)⁸ found that 14% of deaths of drug users (post treatment) were due to violence. Falck et al (2003)¹⁰ report that crack users experience significantly higher levels of fractures/dislocations and musculoskeletal problems than non-users. Zavala & French (2003)¹¹ report that although female drug users experience significantly higher rates of injury and/or trauma than non-users, there was no such difference between male users and non-users.

Overdose, sometimes resulting in the death of the drug user, is another physical consequence of substance misuse. OD can occur at any time, and may depend on the

quality / purity of substances, however studies have shown that OD is more likely following a period of abstinence (such as during a prison term) during which time an individual's tolerance may be reduced. Jones et al (2002)¹² found that of 87 Glasgow residents who died of drugs related OD, 9% had been released from prison within 7 days, and a further 14% released within 14 days, 49% had been released from prison less than one year previously. Specialist addiction services had been accessed at least once in the previous 12 months by 40% of those who died, and 90% of fatalities had consulted with a general practitioner (GP) over the same period. Clearly the time immediately following release from prison is critical and special attention ought to be placed in educating prisoners about to be granted parole as to the dangers of OD. Specialist addiction services and GP clinics are ideally placed to provide such guidance.

Drug users with physical morbidity may report to their GP seeking help with either their addiction or associated physical complication. Weaver et al (1999)¹³ set out to define the role of the primary care physician in dealing with addictions. Although their article begins with the rather depressing statement that the easiest way to recognise a problem of drug abuse is the patient's presentation with a request to stop taking drugs (rather than the physician's role in pre-emptive identification), Weaver does go on to describe the frequent physiological sequelae of addictions, noting that infections may be particularly prevalent.

2.1 HEALTH PROBLEMS RELATED TO SPECIFIC DRUGS

Drug use has been associated with a wide variety of physical health complications; however there is a lack of evidence of causal relationships between specific substance

use and health outcomes. This may be due in part to the poly-drug practices of many substance misusers.

2.1.1 Opiates

In a comprehensive review of the physical complications associated with drug usage, Baigent (2003)¹⁴ reports that opiate use is associated with cognitive impairment, renal disease and death. These associations may be due to the toxicity of the drug, overdose complications, concurrent alcohol misuse or head injury resulting from accident or assault. In particular heroin use has been associated with ischaemic and haemorrhagic stroke¹⁵. Renal complications and infections are associated with parenteral drug usage.

2.1.2 Cocaine

Greenwell & Brecht (2003)¹⁶ found a significantly higher prevalence in cocaine injectors currently in treatment, of hepatitis, kidney or liver problems and immune disorders. Baigent (2003)¹⁴ notes that stimulants (such as crack or cocaine) are associated with bruxism (tooth grinding), hepatic toxicity, cardiovascular toxicity, cerebral toxicity and hyperpyrexia. Chen et al (1996)¹⁷ examined the long term health consequences of cocaine use and found that in males, heavy usage was linked to an increase in physical health problems, and that poor health, as measured by the number of days in hospital, contributes to continued usage of cocaine.

2.1.3 Crack

Falck et al (2003)¹⁰ surveyed 430 “not in treatment” crack smokers in an area of Ohio, USA. Two thirds of their sample reported current physical health problems. The authors compared the participants with a matched sample of non-crack users drawn from a large national survey. Crack users were three times *less* likely to report respiratory problems, four times *more* likely to report digestive problems (particularly dental). The authors found that gender and age were significant predictors of health status in this population, with males and young people less likely to *report* health complications. It should be noted that the frequency and duration of crack usage did not predict health complications. Cornish & O’Brien (1996)¹⁸ discuss the toxicity of crack cocaine, citing examples of complications involving the cardiovascular, neurological and pulmonary systems.

The following table illustrates physical harm associated with specific drug usage:

	Opiates	Cocaine	Crack
Cognitive impairment	✓	✓	✓
Renal dysfunction	✓	✓	✓
Bruxism		✓	✓
Headache		✓	✓
Hepatic toxicity		✓	✓
Cardio-Vascular problems		✓	✓
Respiratory problems	✓		
Digestive problems	✓	✓	✓

2.2 DENTAL HEALTH

Drug users may experience dental morbidity both as a direct consequence of drug treatment (liquid methadone has a high sugar content), and factors associated with their lifestyle (poor diet, lack of contact with primary dental care services). Metsch et al (2002)¹⁹ examined the met and unmet dental health needs of drug users in Miami, finding that IDUs were twice as likely to report unmet dental health needs as non-users.

According to the USA Surgeon General²⁰, poor levels of dental health are linked to mortality and morbidity in the general population. A review of the relevant literature by Loesche (2000)²¹ found associations between dental disorders and cardiovascular conditions. Other research has linked poor oral health with chronic respiratory disease, diabetes and low birth weight.

Sheridan et al (2001)²² surveyed drug users who were accessing community pharmacy services with a matched sample of non-users. They found that IDUs were significantly less likely to have engaged with dental services in the previous 12 months, and significantly more likely to be experiencing current dental health problems. The authors conclude that community pharmacists (and other health professionals who are in contact with IDUs) could refer clients to dentists.

Sheridan et al (2003)²³ evaluated a project where users of a community pharmacy service had their dental health reviewed by pharmacists, and who were referred for further treatment if required. They found that IDUs were two times more likely to require dental treatment than non-users. The authors demonstrate that this brief

intervention (discussion) resulted in an intention to change behaviours, and one third went on to make a further appointment with a dentist (actual rate of attendance is unknown).

2.3 SEXUAL HEALTH

IDUs are at risk of contracting blood borne viruses both by the use of shared injection equipment and through increased (unprotected) sexual activity. Sad (2003)⁶ found that many female IDUs had been (or were currently) involved in commercial sex work. Sad also noted that mucosal dryness associated with crack use could result in increased abrasions with a subsequent increase in the risk of blood borne virus transmission. Falck et al (2003)¹⁰ report evidence for the association of STIs with crack usage, which might explain an observed increase in syphilis among crack users due to the selling of sex for drugs.

Selwyn et al (1993)⁴ looked at HIV positive IDUs usage of primary care and observed twice as many visits as those who were HIV negative. Kemp (2003)⁹ noted that up to 85% of patients attending the Primary Care Unit (see appendix 1) accepted HIV screening, with an incidence of new cases of 1.7%

2.4 THE ROLE OF ALCOHOL

Many IDUs and users of crack cocaine also consume alcohol, often at hazardous or harmful levels. Gossop et al (2002)⁸ note that those working with drug misusers should be aware of the risk of a combination of alcohol and illicit drugs. The specific health consequences of excessive alcohol consumption are described elsewhere²⁴⁻²⁷,

however the population of drug users who also use alcohol may have an increased likelihood of physical morbidity.

Adrian & Barry, (2003)²⁸ noted that drug users who consume excessive alcohol have more health problems than those who don't drink at a hazardous level, reporting a 29% increase in the number of separate diagnoses per case.

The use of alcohol can also result in an increased risk of injury / trauma. Zavala & French (2003)¹¹ found in a survey of 846 males that (for men) problem drinking was a significant predictor of injury / trauma over the previous 12 months. The finding was *not* replicated for women, although almost five times as many drug users as non-drug users consumed alcohol. Weintraub (2001)²⁹ also noted an increased likelihood of hospital admission for trauma among IDUs who were also hazardous drinkers.

3.0 INJECTION RELATED HEALTH PROBLEMS

The injection of drugs can lead to an increased risk of bacterial or viral infection. Stein (1990)³⁰ identified that IDUs are at risk of infections such as bacterial endocarditis, osteomyelitis, septic arthritis, abscesses and cellulitis. Stein & Anderson (2003)³¹ hypothesised that patients in a needle exchange programme would have a higher rate of health service use than those in a methadone maintenance programme. Overall, injectors from both programmes were twice as likely to report admission to hospital as non-injectors. The authors report that each subsequent injection episode (per day) almost doubled the likelihood of infection.

Hopper & Shafi (2002)³² noted that infection was the most common reason for IDU hospitalisation and Weintraub et al (2001)²⁹ noted significant associations between drug usage and hospital admission for infection, particularly among IDUs. Kemp (2003)⁹ lists sepsis as the most significant injection related consequence, but also notes TB, liver disease, STIs and accidents as major causes of injection-related morbidity. Takahashi et al (2003)³³ found that the majority of IDUs presented to an AED with an abscess (72.3%), and that almost half (44.3%) were subsequently hospitalised.

3.1 HEPATITIS AND HARM REDUCTION

Taylor et al (2004)³⁴ note that IDUs may be exposed to hepatitis infection by sharing injection equipment or associated paraphernalia. This sharing behaviour may be related to the physical proximity of needle exchanges. Hutchison et al (2000)³⁵ mapped out the relationship between sharing of injection equipment and location / usage of needle exchange facilities. They found that sharing behaviour was related to both proximity and usage, with users who lived closer to an exchange significantly less likely to engage in sharing activities.

IDUs not in contact with drug services are likely to engage in shared injection activities; Hunter et al (2000)³⁶ found in a survey of 1214 IDUs that 78% shared injection equipment. Rhodes et al (2004)³⁷ found that even users who had good access to needles and syringes still engaged in sharing behaviours under certain circumstances and with 'trusted' partners. Sharing of paraphernalia was common, and this finding was replicated by Taylor et al (2004)³⁴. Both papers noted that IDUs expressed uncertainty regarding HCV transmission and prognosis. The authors call

for a return to the emphasis on IDU responsibility for changing behaviours (“don’t share!”)

In an assessment of the physical health needs of IDUs attending a combined needle exchange / vaccination clinic, Sad (2003)⁶ reported that the prevalence of HCV was much higher than previous estimates. Kemp (2003)⁹ reports that 42% of IDUs demonstrated previous infection with HBV, 62% had been infected with HCV, and 50% with HAV.

Kuo et al (2004)³⁸ examined the correlates of HBV infection among IDUs, finding that women were more likely than men to be infected. For men frequency of injection (and overall lifetime duration of injecting) was associated with past HBV infection. For women, involvement in commercial sex work was significantly associated with infection. The authors also examined HBV vaccination, noting that older IDUs were 60% less likely to have been vaccinated, and that IDUs who have ever been engaged in a drug treatment programme were twice as likely to be vaccinated as those who had not.

The combination of a vaccination programme within existing drug treatment services appears to be successful. Sad (2003)⁶ reporting on the success of a combined needle exchange / vaccination clinic, noted that most clients had successfully completed a schedule of inoculation. Borg et al (1999)³⁹ examined the efficacy of an HBV vaccination programme for methadone maintained users and found that 86% of patients completed the three vaccination series

The most recent HBV vaccination guidance from the Department of Health (1996)⁴⁰ advises three doses over a six month period (0,1,6) or an accelerated schedule over two months (0,1,2) with a booster administered at twelve months. In a review of HBV vaccination protocols, Rich et al (2003)⁴¹ comment that the interval between doses may vary without compromising effectiveness, and that no harm is sustained by receiving in excess of three doses of the vaccine. The authors comment that by making vaccination available at a number of locations, high-risk adults would be more likely to receive a full immunisation schedule. The authors also note that although the three-dose schedule provides optimum protection (up to 90% achieve immunity) that an incomplete series will also offer protection, with a single dose conferring immunity in up to 55% of recipients.

Kemp (2003)⁹ states that screening for all variants of hepatitis should be offered to service users at their first consultation, and at subsequent consultations if at first refused. Patients should be given an initial vaccination (HBV) prior to the results of the serology. An audit of the results of the immunisation programme shows that following a three-dose protocol, only 63% of patients display immunity to HBV. However anecdotal evidence suggests that further doses of vaccine considerably increases the proportion that attain immunity. Due to the availability of screening and vaccination “herd immunity” has been achieved locally, with less than 5 cases of acute HBV over the last 5 years. However, chronic HCV infection has been detected in 58% of those patients screened. Kemp notes that testing for HCV is important as most drug users exceed recommended limits for safe alcohol consumption, and therefore are likely to develop liver complications.

Kemp (2004)⁴² emphasised the usefulness of baseline investigations, in particular the use of blood samples. Serological testing for HBV is recommended, together with post vaccination investigations to test for successful immunity.

4.0 UTILISATION OF PRIMARY CARE SERVICES

4.1 BARRIERS

Hutchinson et al (2000)³⁵ interviewed 2500 IDUs in Glasgow, finding that significantly lower levels of sharing of injection equipment occurred among those participants who lived within one mile of a needle exchange, leading the authors to conclude that access to exchange facilities should be widened to reduce sharing behaviours.

Chitwood et al (1998)⁴³ found that drug users were less likely than non-users to receive health care. In another USA study, Palepu et al (2002)⁴⁴ noted that IDUs were less likely to access primary care than other substance misusers. French et al (2000)⁴⁵ reviewed the interaction between drug usage and health service utilisation. They found that drug users may either perceive or indeed experience barriers (financial, emotive and practical) that impede their uptake and usage of such services. They found that although IDUs had a higher use of AED facilities than non-users, this group utilised outpatient facilities much less than non-users. The authors speculate that the marginalisation of this group by providers of preventative care could cause IDUs neglected health care needs to degenerate into conditions that precipitate AED attendance.

Chitwood et al (2001)⁴⁶ comment that failure to routinely seek preventative care increases the demand for treatment-seeking care, as health problems that if managed at onset would not be problematic, may develop into more serious conditions. The authors note that IDUs are less likely than non-users to receive primary preventative care, concluding that IDUs are ideal candidates for the intervention strategies that increase access to primary preventative care.

An individual's current living situation may mediate their contact with primary care services and exposure to risk behaviours. Fountain et al, (2003)⁴⁷ undertook a community survey of 389 homeless people to determine what their unmet drug and alcohol service needs were; 83% used a drug at least once per month (mainly heroin), and most were not in contact with any primary care services.

In a recent review of the research literature in the USA (McCoy et al, 2001)⁴⁸ highlighted the relationship between drug injection and specific primary health care consequences. The authors present a qualitative exploration of the barriers to accessing health care, based on 1085 participants (26% IDU, n=333 compared to a matched sample of non-drug users) – the findings most applicable to the UK are that “not wanting treatment” (63.4%), “treated self” (47.8%) and “procrastination” (45.7%) were the most common reasons for not seeking help with an existing physical health problem. Overall one in five IDUs thought that seeking help would not be helpful (19.8%), and men were significantly less likely to want treatment than women. The authors note that transportation, childcare and inconvenient hours (all thought to be barriers related to IDUs non-attendance at primary care services) were *not* cited by IDUs as pertinent, but wonder if the attitudinal barriers may have masked

the structural ones. Interestingly IDUs exhibiting the greatest need for primary care services (the sickest) were most likely to procrastinate, but it was unclear as to which came first.

In another USA study Drumm et al (2003)⁴⁹ carried out interviews with 28 crack users. They found evidence of a strong peer influence directed towards avoiding making contact with formal health care providers. They speculated that as drug users alienate their family, peer groups made up of mainly other users are developed; IDUs therefore become further disinclined to seek help. The offer of other resources (food, shower, change of clothes etc) encouraged contact, and this finding has been supported by anecdotal evidence from services within the UK (Islington Primary Care Centre, Kings Cross Primary Care Centre). Interestingly the perceived level of knowledge ascribed to providers was related to the users inclination to engage with services. Convenience (transportation, clinic times) was also important for this group.

Locally Sad (2002)⁶ found that clients of local drug treatment services who might benefit from specialised primary care were reluctant to be referred and followed up in a medical setting. However if the barriers toward accessing health care can be overcome, there is considerable evidence that drug users can benefit. One way of addressing this issue is to offer primary care services directly to those currently engaged with drug treatment services.

4.2 POTENTIAL BENEFITS OF INTEGRATING CARE

The idea that an integrated addictions treatment / primary care service might be of benefit locally is not new. An earlier needs assessment of drug users in the LSL area

by Wilkinson (1996)⁵⁰ recommended that primary care services should help to manage care of IDUs. The possibility of local needle exchanges in providing basic health checks was also discussed. Services geared towards the treatment of addictions could also be located in areas where drug users are likely to seek help with their physical morbidity (GP practices, AEDs). Williams et al (1996)⁷ recommend that admission to hospital for physical health problems can be an opportunity to engage the patient in treatment for their drug addiction. French et al (2000)⁴⁵ suggest that the AED could be employed as a possible site for opportunistic vaccination of IDUs.

Recently there have been calls to improve drug users to access primary care. In an editorial comment, Merrill (2003)⁵¹ urges the integration of primary care services and addiction treatment. The presence of primary care services at addiction treatment centres may encourage clients to re-engage with such services thus increasing retention, and therefore addiction severity may be reduced. Alternatively clients may make the link between drug taking and physical health consequences, and thus change drug related behaviours – a brief intervention. Booth & Grosswieler (1978)⁵² noted that brief intervention was most effective at promoting a change in behaviour when it was delivered at a time of illness, injury or crisis.

Integration of drug treatment and primary care services can result in improved addictions treatment outcomes. Weisner et al (2001)⁵ undertook a randomised controlled trial (RCT) of integrated versus independent delivery of substance misuse and primary medical care (looking at substance misuse related medical conditions) finding significantly higher rates of abstinence in the integrated group, however there were no differences in primary care utilisation for either group.

If integrated services are provided, would drug users make use of them? In an early evaluation of an integrated treatment/care service Selwyn et al (1993)⁴ examined the use of in-house primary care services provided at an outpatient methadone maintenance programme. The authors found that although HIV positive clients made most use of services, over 75% of HIV negative clients also used available primary care services, demonstrating that substance misuse services may be useful sites on which to develop primary care services for drug users.

Samet et al (2001)⁵³ review and discuss the potential benefits of integrating primary care and substance misuse services. Centralised models (a “one-stop-shop”) demonstrate increased uptake of primary care services, increased treatment retention and reduced relapse rates. Distributive models (where a single agency is linked to several centres) make use of existing systems and are therefore reducing costs. The authors conclude that better linkage between primary care and addiction services would lead to improvements in quality of care.

Samet et al (2003)⁵⁴ report on an RCT of the integration of a multi-disciplinary health intervention in a detoxification unit. The Health Evaluation and Linkage to Primary care program (HELP) consisted of a nurse, a physician and a social worker who were based in a dedicated space located within a residential detoxification clinic. The primary outcome goal of the program was to facilitate primary care contacts outside of the project. A significantly higher number of participants in the HELP group made primary care appointments (69%) than those who received addictions treatment as

usual. The authors describe contact with primary care services within an addictions setting as a “reachable moment”.

Friedmann et al (2003)⁵⁵ found that patients in addiction treatment programs with integrated primary care facilities demonstrated better addiction-related outcomes than those in programs that didn’t offer such services. Interestingly concurrent improvement in health-related outcomes was not observed. In a separate study Friedmann et al (2003)⁵⁶ found that low levels of self reported health status at baseline were accurate predictors of low levels at follow-up, and speculate that identification and treatment of physical health problems among patients attending addiction services might lead to better health prognosis.

5.0 ASSESSMENT OF PHYSICAL HEALTH

The assessment of physical health is an important consideration, as a failure to identify the need for primary care services will negate their inherent advantages. It can be undertaken as part of a formal induction into treatment services, or can be opportunistically undertaken as appropriate. There is no standard pro-forma for such an assessment, and a brief analysis of treatment services local to LSL showed among services that do make such an assessment, there is no common assessment tool. Indeed, our review of the literature also found no single instrument that was in common use.

Some studies utilised a general measure of health (such as rating scale of perceived health, number of days off sick etc) in combination with a list of specific conditions.

Chen et al (1996)¹⁷ used separate indicators targeting physical symptoms, self reported health and number of sick or hospital days. Greenwell & Brecht (2003)¹⁶ used two measures of health status: a list of specific health conditions, and an overall assessment of health status (on a scale of 1-5). Friedmann et al (2003)⁵⁶ examined self reported health status before and after treatment as part of the Drug Abuse Treatment Outcomes Study (DATOS). Health status was assessed using a 10 item scale designed to elicit three dimensions of health: subjective concerns of health quality, functional limitations and concern about health.

Other studies simply asked drug users to list their health problems. Falck et al (2003)¹⁰ asked crack users if they had experienced any health problems in the preceding six month period – if the answer was in the affirmative participants were then asked to list what was the nature of the problem and if they had sought medical care for that problem.

Formal questionnaires may be employed to assess client's perceptions of their health. Stein et al (1998)⁵⁷ used the SF-20⁵⁸ to assess health related Quality of Life for a sample of patients seeking drug or alcohol treatment. The authors found that substance misuse was not related to health perceptions. Falck et al (2000)⁵⁹ administered the SF-36⁶⁰ to 443 crack users who were not in treatment. The SF-36 includes one multi-item scale that assesses eight health concepts. The authors observed that increased use of crack was matched by a decrease in perceived health status, confirming the findings of other studies that showed that the use of crack is associated with numerous health problems.

The use of questionnaires to assess physical health may be problematic. Cowley & Houston (2003)⁶¹ developed the Health Needs Assessment Tool (HNAT), a self completion questionnaire, to facilitate better understanding of the physical health needs of their clients. Although the authors found that health professionals responded favourably to the concept of assessing health to better provide services to their clients, most were uncomfortable with its implementation, believing that such a form may encourage them to question rather than to listen. Additionally, the questionnaire caused distress to some clients who felt that the questions placed an emphasis on issues that were unlikely to be resolved. In general it was the clients who had the greatest level of health needs that responded negatively to the HNAT. The authors caution that their findings are only applicable to opportunistic interactions between professional and client, and stress that in situations where help had been actively sought; such instruments were unlikely to be detrimental.

For drug users who present to primary care a full health assessment ought to be undertaken, as per any new registration. However, if drug users present to a GP primarily to obtain prescriptions related to their drug addiction, such a formal assessment may not be undertaken. This situation is far from ideal, and does not facilitate the benefits discussed in the preceding section. McCoy et al (2002)⁶² set out to try and change primary care practitioners' knowledge and skills regarding drug misuse, with the aim of improving their practice towards such patients, particularly toward screening and providing effective interventions. The authors found that participation led to greater awareness of the health care needs of drug users and implementation of screening practices.

Kemp (2004)⁴² advises GPs to take a full assessment of IDUs physical health as early as possible after registration, emphasising that such assessment can help to determine the most appropriate treatment options and establish a baseline from which future improvement in health can be established. Kemp points out that such an assessment can be undertaken across several consultations if required. Although general practitioners are adept at undertaking routine physical examinations among non-drug using patients, this may not be the case with IDUs. Kemp stresses that a general examination of an IDU patient should be supplemented by consideration of general health state (paying attention to symptoms of withdrawal), skin examination, examination of the chest and cardiovascular system, abdominal examination, musculoskeletal system and the central nervous system. Kemp also recommends specific further investigations appropriate for women drug users; investigations appropriate to STIs, discussion of contraception and safe sex practices, and investigations to assess osteoporosis (often associated with alcohol misuse).

CONCLUSIONS AND RECOMMENDATIONS

Problem drug users are likely to experience a range of physical health morbidity as a direct consequence of their substance misuse. Although the treatment for such problems is no different to that for a non drug-using population, and IDUs who receive appropriate primary care have a good prognosis, most primary care services do not offer specific services for IDUs. Furthermore IDUs are disinclined to attend standard primary care services.

Within LSL, the Consultancy Liaison Addiction Service (CLAS) provides a GP liaison service that aims to provide support for practitioners that have drug users on their list. CLAS provide information and training about detoxification and maintenance of dependency, paying court to a patients medical history and the physical morbidity associated with substance misuse. Such services are effective, but reliant upon the GP making a conscious effort to improve their skills with respect to IDUs. Drug users themselves may also be wary of revealing their physical health care needs to their GPs. CLAS provides a useful function in terms of GP training for the management of addictive disorders, but it has limited potential for improving the physical morbidity of this client group.

Accurate assessment of drug users physical health needs forms an essential precursor to treatment. There are many pro-forma assessments available to assist the clinician with such an appraisal. Those recommended set out to provide the practitioner with a comprehensive set of symptoms to look out for, acting as an “aide memoir”, prompting them to investigate conditions that may be associated with substance misuse. Such assessment can be undertaken either within primary care services, or as part of induction to specialist addiction services.

It is likely that users will present to AEDs requiring assistance with their physical health. This provides an ideal opportunity for the AED practitioner to further explore the physical morbidity of the IDU and to make recommendations as to further treatment and/or investigations. However, in the busy AED environment it is unlikely that staff would undertake specific intervention themselves, but our experience regarding alcohol misuse would suggest that staff would be happy to refer clients on

to other services (such as GPs or addictions treatment agencies)^{63;64}. Further work to assess the willingness of AED staff to assess both the physical health needs as well as addictions treatment needs of IDU patients is required.

Many drug treatment services do currently undertake an assessment of their client's physical health as part of their initial assessment. However, having made such an assessment many services are then at a loss as to how to address any needs that have been identified. Clinical staff may feel unable or unwilling to engage in primary care with their clients, and in situations such as this, the use of dedicated staff would prove advantageous. This could be achieved either through the provision of a nurse led primary care team who are based at one or more drug treatment centres (the model favoured by LSL), or through referral to a dedicated GP service (as described by Kemp, 2003⁹). Either model would certainly contribute towards an improvement in both addictions treatment and physical health as systematic assessment can facilitate patient management and lead to improved outcomes (Hopper & Shafi 2002³²).

Clients that make contact with addictions treatment services may benefit from an assessment of their physical health and appropriate intervention. The LSL Drug and Alcohol Health Care Team (DAPCT) will continue the work of the hepatitis immunisation service. However this new team is well placed to undertake thorough assessments of primary health care needs, to deliver appropriate interventions and/or refer as appropriate or to provide training and support to clinical teams within specialist units to enable them to provide appropriate primary care. It is recommended that the impact of the DAHCT on both physical morbidity and treatment outcomes is formally evaluated.

Initially the DAHCT could assess clients using one of the standardised assessment tools listed in the appendix, and report the proportion of clients requiring further primary care input. This would provide evidence to support further development of the team and their remit. Other services, such as wound dressing, could be introduced as appropriate. An audit of referral to other agencies (including AEDs) would help to shape policy for this team and to determine what primary care services could be undertaken by the DAHCT with appropriate training and staffing.

In conclusion it is apparent that drug users have a wide range of physical health needs that are related to and associated with their substance misuse as well as a consequence of their lifestyle choices. Primary care provision for this group is limited both by the attitudes of drug users and health care providers and by the lack of integrated care services. The provision of primary care screening and interventions within specialist addictions services is likely to result in improvements in both physical morbidity and treatment outcomes. It is recommended that the DAHCT should continue to provide hepatitis immunisation services while expanding their remit to encompass a broader range of primary care issues.

APPENDICIES

UK CONTACTS

As part of the background investigations for this review a number of local and national agencies and individuals were canvassed for their opinions on the physical health needs of IDUs and crack cocaine users. Particular attention was paid to their initial assessments and

City Roads: Employ a general checklist of problems at initial assessment. This is delivered by a visiting medical officer (who might have an interest in addictions but is not a specialist). Problems relating to injection sites and related are noted.

The Primary Care Unit: managed by Camden & Islington Mental Health & Social Care Trust, has provided primary care services to substance misusers in North London since 1994. Located in close proximity (the basement) to an addictions outpatient service. 65% of their drugs using patients are not registered with a GP. They do not offer drug prescriptions. Has a shower / laundry facilities for clients. Offers in-house minor surgery for incision / drainage of abscesses and other procedures – this reduces the need to refer patients to AED services. Staff cautions that they spend a lot of time (“significant”) on “administrative” duties, mainly report writing for housing, social services, courts and benefit agencies.

Dr Ian Guy (07092 298033, ian.guy@nhs.net) runs a GP practice in Teesside catering for drug addicts only (n=800 on list).

He noted that the clients have issues in the following areas of physical health:

1. DVT
2. Skin infection / abscess
3. Chronic Obstructive pulmonary Disease
4. STDs

Dr Guy stated that on first contacting the practice the clients were often reluctant to answer questions openly “their drug needs come first, we deal with that and then we can get them to see that physical needs are also important”. Prior to contacting this service, the clients had typically not accessed other primary care services, as they felt stigmatised and unwelcome there.

Alcohol misuse was a big problem and led into many associated health care needs – the practice refers alcohol problems to local specialist services.

It was also noted that once health care needs have been addressed there is a rise in the incidence of both STDs and pregnancy, implying that there might be a need for further work in this area.

In terms of health needs assessment the practice uses a “standard” health history at the point of registration. Anecdotally the clients then disclose further (and more relevant) information as the relationship with the practice develops.

Annie Darby (01472 326690) is a specialist health visitor for drug users and substance misuse. She perceived the primary care needs of her clients to be:

1. Weight / Nutrition
2. Hepatitis status
3. Infections

She is involved in setting up a local nurse practitioner led service to address health care needs for this population, but is not aware of any formal assessment tools in general use, and tends to use an unstructured approach based on experience. Ms Darby could see that an epidemiological tool would be of use for service planning purposes, but was not certain how popular it might be with clients.

The use of HEALTH VISITORS with a remit to engage with drug users – interview with Annie Darby: In East Lincolnshire this service has resulted in increased access to services, better management of physical illness, reduction in BBV and increase in Quality of Life. Note that this has NOT been subject to economic evaluation, trailed in URBAN setting – does the “troubleshooting” approach benefit clients?

The Lambeth Harbour (0207 0951980) is a new crack cocaine project in Lambeth that opened in February 2004. At present they employ one G grade nurse to address the health care issues of users. I am arranging to visit the centre and to discuss the project with the nurse.

CLAS (0207 5829428) the **Consultancy Liaison Addiction Service** offers support to GPs within LSL who are considering providing care to those who misuse drugs. The team will see clients at their home practice. <http://www.clas-sharedcare.org>

Kings Dental Institute (020 7346 3608). I have made contact with Professor Tim Newton and Dr Jenny Gallagher from the Oral Health Research Group. I met with them in early July and they were keen to forge links with local drug treatment agencies. It was suggested that the Oral Health Research Group might liaise with the PCDAHCT with a view to future collaboration / training initiatives. They have asked for dental health needs to be included as part of both the focus group and survey work that we have planned for the next phase of the project. It was anticipated that the results of this work could be used as a basis to commission future (community based) services for drug users.

FORMAL HEALTH ASSESSMENT TOOLS

Current Physical Health Screening Questionnaires in the SLAM area (and those presented as part of NTA models of care toolkits)

Title	Author	Areas covered	Comments on physical health component
Assessment of the substance misuser	K. Kemp	Physical health and immunisation status	A very useful and comprehensive guide. Recommended.
Physical Health Check	M. Phelan	Physical health and drug usage	Designed for use with mental health population, a good basic evaluation
CLAS Team assessment form	CLAS team	Substance misuse history Physical Health Psychiatric History Forensic History	Deals with drug related aspects of health – no mention of current symptoms
Brief Assessment – Marina House	SLaM	Substance use Drug use risks Physical Health	Asks about previous episodes and current concerns
Substance misuse summary and BI record	SLaM	Substance use Risk assessment (inc. physical health) Treatment plan	Open commentary box – guidance towards past & current treatments, current presentation and risk
Common assessment form (Physical needs section)	Bristol DAT	Physical Health	Asks open ended questions about history, current concerns and relationship with substance misuse
Comprehensive assessment (Physical health section)	W. Sussex	Physical health	Specific symptoms checklist and brief history / assessment of need
Community Care Services Assessment of need	Lambeth social services	Use of services Physical health Mental health	Open ended section – history and risk. Further investigations required / action taken
Maudsley Addiction Profile	SLaM / IoP	Physical and Psychological health (section)	Specific symptoms checklist and viral screening

REFERENCES

1. Ramsey M, Baker P, Goulden C, Sharp C, and Sondhi A. Drug misuse declared in 2000: results from the British Crime Survey. 2001. London, Home Office.
2. Hickman M, Cox S, Harvey J, Howes S, Farrell M, Frischer M *et al.* Estimating the prevalence of problem drug use in inner London: a discussion of three capture-recapture studies. *Addiction* 1999;**94**:1653-62.
3. Greater London Alcohol & Drug Alliance. London: The highs and lows. 2003. London, Greater London Authority.
4. Selwyn PA, Budner NS, Wasserman WC, Arno PS. Utilization of on-site primary care services by HIV-Seropositive and Seronegative drug users in a methadone maintenance program. *Public Health Reports* 1993;**108**:492-500.
5. Weisner C, Mertens J, Parthasarathy S, Moore C, Lu Y. Integrating primary medical care with addiction treatment - A randomised controlled trial. *Journal of the American Medical Association* 2001;**286**:1715-23.
6. Sad G. An introduction to the physical health needs of drug users identified by drug users attending a combined needle exchange / vaccination clinic. 2003.
7. Williams H, Salter M, Ghodse AH. Management of substance misusers on the General Hospital ward. *British Journal of Clinical Practice* 1996;**50**:94-8.
8. Gossop M, Duncan S, Treacy S, Marsden J. A prospective study of mortality among drug misusers during a four year period after seeking treatment. *Addiction* 2002;**97**:39-47.
9. Kemp K. The Primary Care Unit: Activity and Development 1998-2003. 2003. Camden & Islington Mental health and Social Care Trust.
10. Falck RS, Wang J, Siegal HA, Carlson RG. Current physical health problems and their predictors among a sample of crack-cocaine smokers in Ohio. *Journal of Psychoactive Drugs* 2003;**35**:471-8.
11. Zavala SK, French MT. Dangerous to your health - The role of chronic drug use in serious injury and trauma. *Medical Care* 2003;**41**:309-22.
12. Jones R, Grur L, Gilchrist G, Seymour A, Black M, Oliver J. Recent contact with health and social services by drug misusers in Glasgow who died of a fatal overdose in 1999. *Addiction* 2002;**97**:1517-22.
13. Weaver MF, Jarvis MAE, Schnoll SH. Role of the primary care physician in problems of substance abuse. *Archives of Internal Medicine* 1999;**159**:913-24.
14. Baigent MF. Physical complications of substance abuse: what the psychiatrist needs to know. *Current opinion in Psychiatry* 2003;**16**:291-6.

15. Neiman J, Haapaniemi HM, Hillbom M. Neurological complications of drug abuse: pathophysiological mechanisms. *European Journal of Neurology* 2000;**7**:595-606.
16. Greenwell L, Brecht ML. Self reported health status among treated methamphetamine users. *American Journal of Drug and Alcohol Abuse* 2003;**29**:75-104.
17. Chen K, Scheier LM, Kandel DB. Effects of chronic cocaine use on physical health: a prospective study in a general population sample. *Drug and Alcohol Dependence* 1996;**43**:23-37.
18. Cornish JW, O'Brien CP. Crack cocaine abuse: An epidemic with many public health consequences. *Annual Review of Public Health* 1996;**17**:259-73.
19. Metsch L, Crandall L, Wohler-Torres B, Miles CC, Chitwood DD, McCoy CB. Met and unmet need for dental health services among active drug users in Miami, Florida. *The journal of behavioural health services & research* 2002;**29**:176-88.
20. Satcher D. Oral health in America: A report of the Surgeon General. 2000. Washington, National Institute of Health.
21. Loesche WJ. Periodontal disease: Link to cardiovascular disease. *Compendium of Continuing Education Dentistry* 2000;**21**:463-70.
22. Sheridan J, Aggleton M, Carson T. Dental health and access to dental treatment: a comparison of drug users and non-users attending community pharmacies. *British Dental Journal* 2001;**191**:453-7.
23. Sheridan J, Carson T, Aggleton M. Providing dental health services to drug users: testing a model for a community pharmacy advice and referral scheme. *The Pharmaceutical Journal* 2003;**271**:180-2.
24. Rehm J, Sempos CT. Alcohol consumption and all cause mortality. *Addiction* 1995;**90**:471-80.
25. Britton A, McPherson K. Mortality in England and Wales attributable to current alcohol consumption. *Journal of Epidemiology and Community Health* 2001;**55**:383-8.
26. Dawson DA. Alcohol consumption, alcohol dependence, and all-cause mortality. *Alcoholism: Clinical and Experimental Research* 2000;**24**:72-81.
27. Strategy Unit. Alcohol Harm Reduction Strategy For England. 2004. London, The Cabinet Office.
28. Adrian M, Barry SJ. Physical and mental health problems associated with the use of alcohol and drugs. *Substance use and misuse* 2003;**38**:1575-614.

29. Weintraub E, Dixon L, Delahanty J, Schwartz R, Johnson J, Cohen A *et al.* Reason for medical hospitalisation among adult alcohol and drug abusers. *American Journal on Addictions* 2001;**10**:167-77.
30. Stein MD. Medical complications of intravenous drug use. *Journal of General Internal Medicine* 1990;**5**:249-57.
31. Stein MD, Anderson B. Injection frequency mediates health service use among persons with a history of drug injection. *Drug and Alcohol Dependence* 2003;**70**:159-68.
32. Hopper JA, Shafi T. Management of the hospitalised injection drug users. *Infectious Disease Clinics of North America* 2002;**16**:571-3.
33. Takahashi TA, Merrill JO, Boyko EJ, Bradley KA. Type and location of injection drug use-related soft tissue infections predict hospitalisation. *Journal of Urban Health-Bulletin of the New York Academy of Medicine* 2003;**80**:127-36.
34. Taylor A, Fleming A, Rutherford J, and Goldberg D. Examining the injecting practices of injecting drug users in Scotland. 2004. Edinburgh, Effective Interventions Unit. Scottish Executive Drug Misuse Research Programme.
35. Hutchinson SJ, Taylor A, Goldberg DJ, Gruer L. Factors associated with injecting risk behaviour among serial community-wide samples of injecting drug users in Glasgow 1990-94: implications for control and prevention of blood-borne viruses. *Addiction* 2000;**95**:931-40.
36. Hunter GM, Stimson GV, Judd A, Jones S, Hickman M. Measuring injecting risk behaviour in the second decade of harm reduction: a survey of injecting drug users in England. *Addiction* 2000;**95**:1351-61.
37. Rhodes T, Davis M, Judd A. Hepatitis C and its risk management among drug injectors in London: renewing harm reduction in the context of uncertainty. *Addiction* 2004;**99**:621-33.
38. Kuo I, Sherman SG, Thomas DL, Strathdee SA. Hepatitis B virus infection and vaccination among young injection and non-injection drug users: missed opportunities to prevent infection. *Drug and Alcohol Dependence* 2004;**73**:69-78.
39. Borg L, Khuri E, Wells A, Melia D, Bergasa NV, Ho A *et al.* Methadone maintained former heroin addicts including those who are anti-HIV-1 seropositive, comply with and respond to hepatitis B vaccination. *Addiction* 1999;**94**:489-93.
40. Hepatitis B. *Immunisation against Infectious Disease*, London: Department of Health, 1996.
41. Rich JD, Ching CG, Lally MA, Gaitanis MM, Schwartzapfel B, Charuvastra A *et al.* A review of the case for hepatitis B vaccination of high risk adults. *American Journal of Medicine* 2003;**114**:316-8.

42. Kemp K. Physical Health and Drug Misuse. In Beaumont B, ed. *Care of Drug Users in General Practice, a harm reduction approach*, Radcliffe Medical Press, 2004.
43. Chitwood DD, McBride DC, Metsch L, Comerford M, McCoy CB. A comparison of the need for health care by injection drug users, other chronic drug users, and non-drug users. *American Behavioral Scientist* 1998;**41**:1107-22.
44. Palepu A, Horton NJ, Campagnoni N, Dukes K, Meli S, Samet JH. The effect of substance abuse treatment on uptake of anti-retroviral therapy and health care utilization. *Journal of General Internal Medicine* 2002;**17**:117.
45. French MT, McGeary KA, Chitwood DD, McCoy CB. Chronic illicit drug use, health service utilisation and the cost of medical care. *Social Science and Medicine* 2000;**50**:1703-13.
46. Chitwood DD, Sanchez J, Comerford M, McCoy CB. Primary preventative health care among injection drug users, other sustained drug users, and non-users. *Substance use and misuse* 2001;**36**:807-24.
47. Fountain J, Howes S, Strang J. Unmet drug and alcohol service needs of homeless people in London: A complex issue. *Substance use and misuse* 2003;**38**:377-93.
48. McCoy CB, Metsch L, Chitwood DD, Miles CC. Drug use and barriers to use of health care services. *Substance use and misuse* 2001;**36**:789-806.
49. Drumm RD, McBride DC, Metsch L, Page JB, Dickerson K, Jones B. "The rock always comes first": Drug users accounts about using formal health care. *Journal of Psychoactive Drugs* 2003;**35**:461-9.
50. Wilkinson P. Needs Assessment for Alcohol and Drug Users in LSL. 1996. London. Substance Misuse: The Joint Community Care Plan for Inner South East London: 1997/8.
51. Merrill JO. Integrating medical care and addiction treatment. *Journal of General Internal Medicine* 2003;**18**:68-9.
52. Booth RE, Grosswiler RA. Correlates and predictors of recidivism among drinking drivers. *International Journal of the Addictions* 1978;**13**:79-88.
53. Samet JH, Friedmann PF, Saitz R. Benefits of linking primary medical care and substance abuse services. *Archives of Internal Medicine* 2001;**161**:85-91.
54. Samet JH, Larson MJ, Horton NJ, Doyle K, Winter M, Saitz R. Linking alcohol and drug dependent adults to primary medical care: a randomised controlled trial of a multi-disciplinary health intervention in a detoxification unit. *Addiction* 2003;**98**:509-16.

55. Friedmann PD, Zhang Z, Hendrickson J, Stein MD, Gerstein DR. Effect of primary medical care on addiction and medical severity in substance abuse treatment programs. *Journal of General Internal Medicine* 2003;**1**:1-8.
56. Friedmann PD, Lemon SC, Anderson BJ, Stein MD. Predictors of follow-up health status in the Drug Abuse Treatment Outcome Study (DATOS). *Drug and Alcohol Dependence* 2003;**69**:243-51.
57. Stein MD, Mulvey KP, Plough A, Samet JH. The functioning and well being of persons who seek treatment for drug and alcohol use. *Journal of Substance Use* 1998;**10**:75-84.
58. Stewart AL, Hays RD, Ware JE. The MOS short-form general health survey. Reliability and validity in a patient population. *Medical Care* 1988;**26**:724-35.
59. Falck RS, Wang J, Carlson RG, Siegal HA. Crack-cocaine use and health status as defined by the SF-36. *Addictive Behaviors* 2000;**25**:579-84.
60. McHorney CA, Ware JE, Raczek AE. The MOS 36-item short form health survey (SF-36): Psychometric and clinical tests of validity in measuring physical and mental health constructs. *Medical Care* 1993;**31**:247-63.
61. Cowley S, Houston AM. A structured health needs assessment tool: acceptability and effectiveness for health visiting. *Journal of Advanced Nursing* 2003;**43**:82-92.
62. McCoy CB, Messiah SE, Zhao W. Improving access to primary health care for chronic drug users: An innovative systemic intervention for providers. *Journal of Behavioral Health Services & Research* 2002;**29**:445-57.
63. Patton R, Crawford MJ, Touquet R. Impact of health consequences feedback on patients acceptance of advice about alcohol consumption. *Emergency Medicine Journal* 2003;**20**:451-2.
64. Wright S, Moran L, Meyrick M, O'Connor R, Touquet R. Intervention by an alcohol health worker in an accident and emergency department. *Alcohol & Alcoholism* 1998;**33**:651-6.